

SECTION V. SCA MAINTENANCE

WARNING

Before attempting to service any ASOS equipment, the technician must perform the following:

Upon arrival at an airport, notify airport security and gain access to the system by following local procedures.

Adhere to all airport traffic regulations.

Before crossing any runway, radio the tower (ground control) and request clearance.

Proceed only after obtaining clearance from ground control and only after illuminating the caution light mounted atop the vehicle.

14.5.1 GENERAL

This section contains corrective and preventive maintenance procedures for the single-cabinet ASOS (SCA). Preventive maintenance procedures identify quarterly and semiannual tasks required to keep the SCA in peak operating condition. Corrective maintenance procedures include those for performing system diagnostic test, fault isolation, and removing and installing field replaceable units (FRU's). The system diagnostic test runs continuously and automatically and prints a system operational status message after each self-test cycle. If self-test detects a failure, the suspected FRU is identified in the system maintenance log by reference designator. The technician's first step in restoring system operability is to replace the identified FRU. The corrective maintenance table in this section is used if the system does not automatically identify an FRU.

14.5.1.1 Tools and Test Equipment. Tools and test equipment required to perform maintenance on the system are listed in Chapter 1, Section V. These are preferred items that the technician should have available to perform maintenance on the system. If the specific item listed in the table is not available, an equivalent item may be substituted. Specific tools required for removal and installation of each FRU are specified in each procedure.

14.5.1.2 Consumable Materials List. Consumables needed to maintain the SCA are the same as for the standard multicabinet ASOS listed in Chapter 1, Section V. Although the Source column lists a recommended source for some consumable items, the technician may substitute equivalent products.

14.5.1.3 Maintenance Action Recording and Documentation. Whenever a maintenance technician performs maintenance tasks, all actions must be documented in the system maintenance log. For the purpose of entering unit or assembly identification numbers the procedure in table 14.5.1 is performed.

Table 14.5.1. Maintenance Documentation Procedures

Step	Procedure
1	Sign onto system as TECH.
2	Press MAINT key. Observe that maintenance display screen is displayed.
3	Press ACT key and observe that maintenance action screen is displayed.
4	Press START to store a maintenance action message in system maintenance log (SYSLOG) page in preparation for maintenance action which is to follow.
5	Select required maintenance action, categorized as either preventive maintenance, corrective maintenance, calibration, or field modification kit installation.
6	Upon completion of required maintenance task, select appropriate maintenance page (PREVT, CORR, CAL, or FMK).
7	Enter appropriate identification numbers and exit screen.
8	From 1-minute screen, select REVUE followed by SYSLOG. Enter any additional maintenance data or messages into SYSLOG and verify that all maintenance actions performed have been entered in SYSLOG.
9	Sign off of ASOS.

14.5.2 PREVENTIVE MAINTENANCE

ASOS preventive maintenance is performed at two intervals: 90 days and semiannually. Chapter 1 contains general information about preventive maintenance of ASOS systems and equipment. SCA preventive maintenance tasks consist of visual inspection procedures (table 14.5.2), SCA facilities maintenance (table 14.5.3), and cleaning (table 14.5.4).

14.5.2.1 Desiccant. A desiccant dryer is installed in the center of the SCA cabinet, in the air line leading from the pressure sensors to the pressure sensing port. The desiccant is a silica gel (i.e., a drying agent). The gel is a consumable item in powdered form that is contained and if necessary, replaced in the bowl unit of the dryer. Before handling the desiccant, the Material Safety Data Sheet (MSDS) for Davidson Blue Indicating Gel issued by W.R. Grace & Co., P.O. Box 2117, Baltimore, MD 21203 (telephone: 410-659-9000) or the current supplier should be obtained from the supervisor and read. The gel should be replaced with new desiccant when necessary in accordance with table 14.5.2A.

Table 14.5.2. Visual Inspection Procedures

Step	Procedure
1	With power applied, ensure that fan (on rear of UPS), and muffin fans (on bottom of VME card rack) are operating correctly.
2	With power applied, at wind sensor tower, cover light sensor on tower light control box and ensure that clearance lights (at top of tower) illuminate.
3	Remove power from system, inspect interior of all cabinets for signs of pinched or chafed wiring, loose hardware, and proper connector mating.
4	With power off, check outside of all enclosures for signs of corrosion.
5	With power off, at sensor pad, ensure that all hardware securing sensors to pad is tight. Check each mounting column for visual signs of wear or corrosion. Ensure that there are no cracks in columns.
6	Inspect desiccant in desiccant dryer (Dryer, figure 14.1.3). If indicated by color, remove and replace desiccant (refer to table 14.5.2A).
<p style="text-align: center;">NOTE</p> <p>After performing visual inspection procedure, reapply power to the system and wait until the system initializes and successfully completes its diagnostic check before leaving the area.</p>	

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Table 14.5.2A. Desiccant Replacement Procedure

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Step	Procedure
	<p>Tools and material required:</p> <p>Hand-held vacuum cleaner</p> <p>Mild detergent and water</p> <p>Lint-free cloth(s).</p> <p><u>CAUTION</u></p> <p>Before handling the desiccant, the Material Safety Data Sheet (MSDS) for Davidson Blue Indicating Gel issued by W.R. Grace & Co., P.O. Box 2117, Baltimore, MD 21203 (telephone: 410-659-9000) or the current supplier should be obtained from the supervisor and read.</p> <p><u>NOTE</u></p> <p>Wring out cloth before washing screens.</p>
1	At SCA cabinet, loosen dryer clamp ring, slide off metal bowl guard, and unscrew bowl from top housing.
2	Pour out used desiccant into plastic bag and seal bag for proper disposal.
3	<p>Open new container and refill bowl, shaking or tapping bowl to settle desiccant to 1/2 inch from top of bowl.</p> <p><u>CAUTION</u></p> <p>Do not install the bowl without installing the metal bowl guard.</p>
4	Replace bowl, bowl guard, and clamp ring onto unit. Ensure that clamp ring is securely in place.

Table 14.5.3. Facilities Maintenance Checklist

Item	Task	Period
Towers and pedestals	Inspect for corrosion	Semiannually
Fasteners	Paint	Semiannually, Yearly
Foundations	Inspect condition	Yearly
Fencing	Inspect condition Paint	Yearly Yearly
Signage	Inspect condition Paint	Yearly Yearly
Lightning protection system	Inspect condition	Semiannually
Roads and walkways	Inspect condition: Snow removal:	Yearly Quarterly (in season)
Land	Inspect ground cover: Inspect grass height: Snow removal:	Yearly Quarterly (in season) Quarterly (in season)
Electrical equipment & cables	Inspect condition: Check operation:	Semiannually Quarterly

Table 14.5.4. Cleaning Procedure

Step	Procedure
	<p>Tools and material required: Hand-held vacuum cleaner Mild detergent and water Lint-free cloth(s).</p> <p style="text-align: center;"><u>WARNING</u></p> <p>Ensure that power has been removed from any peripheral device before cleaning that device.</p> <p style="text-align: center;">NOTE</p> <p>Wring out cloth before washing screens.</p>
1	Using soft cloth dampened with mixture of mild detergent and water, clean CRT display screens and external cases of peripheral devices. Using lint-free cloth, dry screens and cases.
2	Using small hand-held vacuum cleaner, remove dust from OID keyboard and printer.

14.5.3 CORRECTIVE MAINTENANCE

Corrective maintenance involves isolation, removal, and replacement of faulty FRU's. The ASOS is equipped with an automatic self-test program designed to isolate most faults to a single FRU; however, due to system hardware configuration, there will be instances when the diagnostics can only isolate to a group of FRU's, such as a sensor or an I/O channel. The troubleshooting approach for these two types of conditions is very different. When the FRU is specifically identified, the technician need only replace the faulty unit.

14.5.3.1 Warmup and Initialization. To ensure proper operation of the system, the technician must allow the SCA to automatically initialize after application of primary power and then verify that the continuous self-test diagnostics run without failure. Table 14.5.5 provides corrective maintenance symptom analysis information.

14.5.3.1.1 System Diagnostics. System diagnostics run continuously in the background. The diagnostics complete a check of the entire system every 7 minutes. Test data received from the diagnostic program is displayed on the technician interface display screens. Error messages are also entered into the system log and printed on the printer.

14.5.3.1.2 Preliminary Troubleshooting Checks. When the diagnostics program identifies two or more FRU's as the trouble source, the technician must isolate the failed FRU. Using Section IV theory of operation and associated drawings as references, the following two basic procedures are performed:

- a. Check connectors to ensure that all boards, cables, and connectors are present and correctly connected.
- b. Check AC and DC power.

Although ASOS monitors all critical power supply voltages in the SCA, sensors, and DCP's, failure of a power supply could result in loss of communications between circuits powered by that supply and the rest of the system. Power supplies are tested by both visual inspection and electrical checks. Before measuring voltages, the technician should visually inspect the area of the suspected FRU for obvious signs of power supply failure. During this inspection, the technician should pay particular attention to circuit breakers, panel lights, and light emitting diodes (LED's) to ensure that they are functioning normally then use a digital multimeter (DMM) to check voltages at fuses and power supply output terminals. In most cases, these tests will isolate the faulty FRU.

Table 14.5.5. Symptom Analysis

Symptom	What To Do	How To Do It
SCA system is completely dead.	Check ac and dc power.	Refer to SCA ac/dc power distribution diagram (figure 14.4.9 and 14.4.12) and use DMM to verify voltages.
Problem with UPS.	Check UPS operation.	Refer Chapter 2, Section V.
SCA computer does not initialize.	Check VME card rack.	Refer Chapter 2, Section V.
SCA heaters do not work.	Check heater circuit.	Refer Chapter 2, Section V.
Loss of SCA communications.	Check communications links.	Refer Chapter 2, Section V.
SIO CCA failure or communications loss with a peripheral or user.	Check SIO boards.	Refer Chapter 2, Section V.
WIND SENSOR does not respond.	1. Check fiberoptic modules. 2. Troubleshoot sensor.	Refer to paragraph 14.5.3.2. Refer Chapter 4, Section V.
TEMPERATURE/DEWPOINT SENSOR does not respond.	1. Check fiberoptic modules. 2. Troubleshoot sensor.	Refer to paragraph 14.5.3.2. Refer to Chapter 5, Section V.
VISIBILITY SENSOR does not respond.	1. Check fiberoptic modules. 2. Troubleshoot sensor.	Refer to paragraph 14.5.3.2. Refer to Chapter 6, Section V.
PRESENT WEATHER SENSOR does not respond.	1. Check fiberoptic modules. 2. Troubleshoot sensor.	Refer to paragraph 14.5.3.2. Refer to Chapter 7, Section V.
PRESSURE SENSORS All 3 incorrect. 1 or 2 incorrect. 1 sensor does not respond.	Clean pressure port. Replace sensor(s). Troubleshoot sensor.	Refer to Chapter 8, Section V. Refer to Chapter 8, Section V. Refer to Chapter 8, Section V.
CEILOMETER does not respond.	1. Check fiberoptic modules. 2. Troubleshoot sensor.	Refer to paragraph 14.5.3.2. Refer to Chapter 9, Section V.
TIPPING BUCKET does not report rain accumulation.	Test the rain gauge.	Refer to Chapter 10, Section V.

14.5.3.2 Fiberoptic Module Test. The SCA communicates with sensors via fiberoptic data links. Each fiberoptic link is made up of a fiberoptic module in the SCA, a corresponding module in the sensor, and two fiberoptic cables linking the two modules. These modules are optoelectric transducers that convert RS-232 serial digital data in electric media to optical media and vice versa. The model H083 temperature/ dewpoint sensor operates in simplex mode where data is periodically sent to the SCA. Communications mode for the rain gauge sensor is half-duplex, but it does not communicate in RS-232 or any other digital format: it merely sends an optical pulse over the inbound link each time the rain bucket tips. All other sensors use full-duplex communication mode, where simultaneous unidirectional messages pass over the paired fiberoptic links.

In full-duplex communication mode, each link of the fiberoptic pair is unidirectional. In half-duplex RS-232 communication, the SCA polls the sensor via one link, then the sensor responds with the requested data over the other link. In simplex communication, the links are redundant, with time-shared bidirectional message transfer over each link. Fiberoptic links are not tested automatically: they must be tested with an RS-232 test tool as directed in table 14.5.6 for the half-duplex link and table 14.5.7 for the HO-83 link.

Table 14.5.6. Fiberoptic Link Testing - Half-Duplex Link

Step	Procedure
1	At OID, access sensor configuration page. Determine assigned SIO port. Refer to SIO port assignments (table 14.4.1) and identify corresponding fiberoptic module.
2	Connect RS-232 test tool in line with fiberoptic module.
3	Using RS-232 test tool, verify periodic activity on TxD pin. If pin is active, proceed to step 4; if inactive, problem is in SIO board.
4	Using RS-232 test tool, verify activity on RxD pin in response to TxD signals. If TxD and RxD pins both are active, problem is in SIO board. If RxD pin is inactive, proceed to step 5.
5	Remove RS-232 test tool from fiberoptic module and reconnect DB-9 connector to module.
6	At failing sensor, connect RS-232 test tool in line with sensor fiberoptic module (between fiberoptic module and corresponding DB-9 connector from cabinet harness).
7	Verify periodic activity on TxD signal on RS-232 test tool. If signal is active, continue with step 8. If signal is not active, proceed to step 9.
8	Using RS-232 test tool, verify RxD pin activity in response to TxD signals. If no activity on RxD signal, problem is sensor serial data interface circuits. If both TxD and RxD pins are active, proceed to step 9.
9	Remove RS-232 test tool from sensor fiberoptic module and reconnect DB-9 connector to module. One at a time, remove and replace following units and retest system until problem is corrected: <ol style="list-style-type: none"> Fiberoptic module in SCA (or DCP) Fiberoptic module in sensor If TxD signal was missing (step 7), replace transmit fiberoptic cable between DCP (or SCA) and sensor (transmit cable is farthest from DB-9 connector on fiberoptic module)
10	If all signals were active through step 9, replace receive fiberoptic cable between DCP (or SCA) and sensor (receive cable is nearest to DB-9 connector on fiberoptic module).

Table 14.5.7. Fiberoptic Link Testing - HO83 Link

Step	Procedure
1	At HO83 sensor, connect RS-232 test tool in line with sensor fiberoptic module (between fiberoptic module and corresponding DB-9 connector from cabinet harness).
2	Verify periodic activity of RxD signal on RS-232 test tool. If RxD is active, proceed to step 3; if RxD is inactive, problem is in HO83 sensor serial data interface.
3	Remove RS-232 test tool from HO83 fiberoptic module and reconnect DB-9 connector to module.

Table 14.5.7. Fiberoptic Link Testing - HO83 Link -CONT

Step	Procedure
4	At OID, access sensor configuration page. If HO83 sensor is associated with a remote DCP, determine sensor's assigned SIO port. Refer to list of Port Assignments for DCP SIO Boards (table 3.4.1) and identify corresponding fiberoptic module. If HO83 sensor is associated with SCA, refer to SIO Port Assignments (table 14.4.1) and identify corresponding fiberoptic module.
5	At DCP (or SCA), connect RS-232 test tool in line with fiberoptic module for HO83 sensor (between fiberoptic module and corresponding DB-9 connector from cabinet harness).
6	Verify periodic activity of RxD pin on RS-232 test tool. If RxD is active, problem is in SIO board. If RxD is inactive, proceed with step 7.
7	Remove RS-232 test tool from fiberoptic module and reconnect DB-9 connector to module. One at a time, remove and replace following units and retest system until problem is corrected: <ol style="list-style-type: none"> Fiberoptic module in cabinet. Fiberoptic module in sensor. Receive fiberoptic cable.

14.5.3.3 **Modem Setup.** SCA modems must be set up after installation by configuring the SCA serial communications. Additionally, stand-alone modems connecting remote peripherals to the SCA by leased line must be set up manually. The following paragraphs describe setting up the SCA modems and stand-alone modems.

14.5.3.3.1 **Setting Up SCA Modems.** SCA modems are configured via the SCA serial communications page after installation. From this page, the modem is assigned a function, assigned to an SIO port, assigned a baud rate, and specified for leased line operation. The baud rate for the model 2440 modem is 2400 for OID's, VDU's, and printers. The baud rate is 9600 for the model V.3225 modem and 28800 for the model V.3400 modem. After the modem is installed and configured on the SCA serial communications page, the SCA program automatically programs the modem for operation. No other action is required on the part of the technician.

14.5.3.3.2 **Setting Up Stand-Alone (S/A) Modems.** After the S/A modem is installed at the peripheral end, it must be manually programmed to operate in leased line mode with the correct parameters. The LCD display and the YES and NO pushbutton switches on the front panel of the modem (same as standard ASOS rack-mounted modems) are used to program the modem. The modem LCD displays main menus, submenus, and configuration options to the technician. The YES/NO pushbuttons are used to sequence through the main menus and submenus and to select appropriate options. The Installation and Operation Manual for the stand-alone modem provides detailed information on all menus, submenus, and options available with the modem.

§ Refer to Paragraph 2.5.5.2 for model 2440, V.3225, and V.3400 stand-alone modem settings.

These tables address only the settings that must be checked or changed by the technician. They do not address options that are automatically set by the factory or are not required for ASOS operation. The menu and option titles that appear on the LCD display vary from site-to-site, depending on modem firmware.

§ 14.5.3.3.3 **Setting Up Johnson Data RF Modem.** Johnson Data rf modem frequencies are assigned and setup at the depot. Order rf modem part number 62828-40506-1 for 410.075 MHz or 62828-40506-2 for 410.950 MHz.

14.5.3.4 **FRU and Subassemblies Removal and Installation.** Removal and installation procedures for most FRU's and subassemblies are the same as those for the standard ASOS system, which are listed in Chapter 2, Section V. Those procedures that are unique to the SCA configuration are given in the following paragraphs.

14.5.3.4.1 Removal and Replacement of VME 7A1A1A2 CCA's. Typical assignment of CCA's to VME slots is shown on figure 14.5.1, but an SCA for any particular site could be equipped with additional, optional, CCA'S depending upon site requirements. Procedures for circuit card removal and installation is the same as given for the standard ASOS in Chapter 2, Section V. Each CCA has a board puller lever located at the top and bottom which forcibly extracts the CCA from the slot and backplane connectors.

14.5.3.4.2 Removal and Replacement of Memory Board 7A1A1A2A3. Before removing Memory Board 7A1A1A2A3, blank panel 7A1A1A2A4 must be removed to gain access to Memory Board 7A1A1A2A3.

1	CPU BOARD #1
2	CPU BOARD #2
3	MEMORY BOARD 110
4	BLANK (RESERVED FOR MEMORY BOARD #2)
5	SIO BOARD 1 (RS-422)
6	SIO BOARD 2 (RS-232)
7	SIO BOARD 3 (RS-232)
8	SIO BOARD 4 (RS-232)
9	SIO BOARD 5 (RS-232)
10	SIO BOARD 6 (RS-232)
11	SIO BOARD 7 (RS-232)
12	BLANK (RESERVED FOR SIO BOARD #8)
13	A/D BOARD
14	VME RESISTOR BOARD
15	DIGITAL I/O BOARD
16	BLANK
17	BLANK
18	BLANK
19	BLANK
20	VOICE PROCESSOR (CPU)
21	VOICE AUDIO

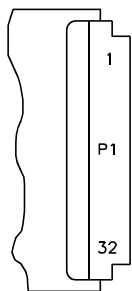
Figure 14.5.1. VME CCA Locations

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14.5.3.4.3 Removal and Replacement of SCA UPS 7A1A1A6. The following tables remove UPS 7A1A1A6 (table 14.5.8), install UPS 7A1A1A6 (table 14.5.9, and set the UPS DIP switches (table 14.5.10).

Table 14.5.8. UPS 7A1A1A6 Removal Procedure

Step	Procedure
1	Set ASOS facility power breaker OFF and tag breaker.
2	Raise SCA cover and set support arms.
3	At Circuit Breaker Panel 7A1A1A3, set UPS CB1 OFF; then set UPS switch (on 7A1A6 control panel, on bottom) to OFF.
4	On Circuit Breaker Panel 7A1A1A3, set all other circuit breakers OFF.
5	Prior to disconnecting UPS, record UPS connections to ensure correct connection upon installation.
6	Disconnect battery power connector from UPS, and disconnect ac power cord with yellow pendant connector from cabinet harness connector W106P36.
7	Disconnect yellow UPS ac output plug, W106P37, from UPS bottom panel, then disconnect remaining ac plugs from UPS bottom panel receptacles.
8	Disconnect RS-232 connector W106P20.
9	Loosen UPS strap.
10	Lift UPS out of the SCA.



PIN NUMBER	ROW A SIGNAL MNEMONIC	ROW A SIGNAL MNEMONIC	ROW A SIGNAL MNEMONIC
1	D00	BBSY	D08
2	D01	BCLR	D09
3	D02	ACFAIL	D10
4	D03	BG0IN	D11
5	D04	BG0OUT	D12
6	D05	BG1IN	D13
7	D06	BG1OUT	D14
8	D07	BG2IN	D15
9	GND	BG2OUT	GND
10	SYSCLK	BG3IN	SYSFAIL
11	GND	BG3OUT	BERR
12	DS1	BR0	SYSRESET
13	DS0	BR1	LWORD
14	WHITE	BR2	AM5
15	GND	BR3	A23
16	DTACK	AM0	A22
17	GND	AM1	A21
18	AS	AM2	A20
19	GND	AM3	A19
20	IACK	GND	A18
21	IACKIN	SERCLK(1)	A17
22	IACKOUT	SERDAT(1)	A16
23	AM4	GND	A15
24	A07	IRQ7	A14
25	A06	IRQ6	A13
26	A05	IRQ5	A12
27	A04	IRQ4	A11
28	A03	IRQ3	A10
29	A02	IRQ2	A09
30	A01	IRQ1	A08
31	-12V	+5V STDBY	+12V
32	+5V	+5V	+5V

PUB37

Figure 14.5.2. VME CCA Connector Pin Assignment

Table 14.5.9. UPS 7A1A1A6 Installation Procedure

Step	Procedure
1	Ensure that ASOS facility power breaker is OFF and breaker is tagged.
2	With SCA cover raised, check that all wires and cables are clear of UPS mounting shelf.
3	Lift UPS into place on mounting shelf.
4	Fasten UPS mounting strap.
5	Connect RS-232 connector W106P20.
6	Connect UPS outputs as recorded per table 14.5.8 step 5.
7	Refer to table 14.5.10 and set UPS DIP switches (Deltek UPS 62828-90338-10 only; Deltek 62828-90338-20 does not have dip switches).

Table 14.5.10. UPS DIP Switch Setup (Deltek UPS 62828-90338-10 Only)

Sw	Set to Position	Position Functions	Alternate Position Functions
1	1 & 2 OFF 1 OFF, 2 ON	120 V input 127 V input	
2	1 & 2 ON 2 OFF, 1 ON	120 V input w/ext range 110 V input w/ext range	
3	OFF	Enable Site Warning Alarm	Disable Site Warning Alarm

Table 14.5.10. UPS DIP Switch Setup (Deltek UPS 62828-90338-10 Only) -CONT

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Sw	Set to Position	Position Functions	Alternate Position Functions
4	OFF	Backup time ≈2 minutes	4 →ON, backup time ≈5 minutes
5	OFF	Enable <5% load auto shutdown	5 →ON disables <5% load auto shutdown
6	OFF	(Not used.)	
7	OFF	Baud rate=1200	7 -ON Baud rate =9600
8	OFF	60 Hz input select	8 -OFF = 50 Hz (Not used.)

14.5.3.4.4 **Removal and Installation of Faraday Box 7A1A3 Subassemblies.** Figure 14.5.3 identifies connectors and subassemblies of Faraday Box Assembly 7A1A3. The fiberoptic modules are socket-mounted on top of the box. Table 14.5.11 describes Faraday box internal wiring and terminals.

Table 14.5.11. Faraday Box Access Procedure

Step	Procedure
1	Ensure that ASOS facility power breaker is OFF and breaker is tagged.
2	At SCA Circuit Breaker Panel 7A1A1A3, set all circuit breakers OFF.
3	Set UPS power switch OFF.
4	At Faraday Box 7A1A3 front cover, remove perimeter screws and remove front cover.

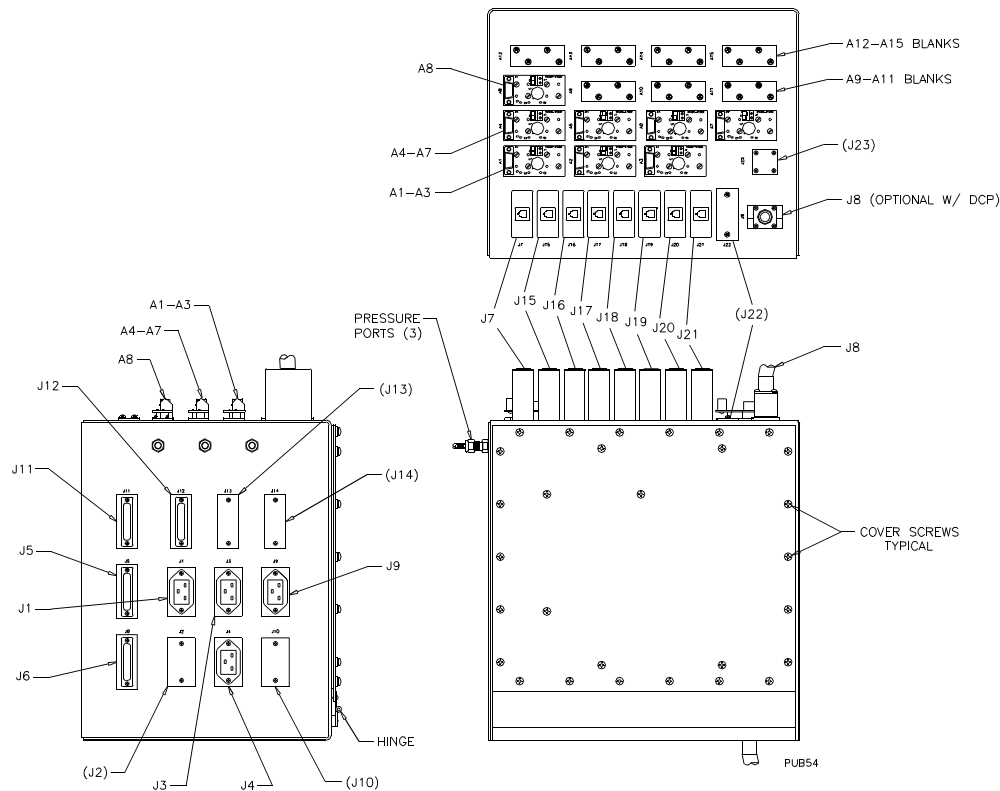


Figure 14.5.3. Faraday Box Assembly A3, Parts Location Diagram

14.5.3.4.5 Removal and Installation of Alternative GTA Antenna. At SCA sites where the alternative GTA antenna (ground plane antenna mounted on the wind tower) is installed, use the procedures in table 14.5.12 for replacement of the antenna.

Table 14.5.12. Removal and Installation of Alternative GTA Antenna

Step	Procedure
REMOVAL	
Tools required:	
#1 Flat blade screwdriver	
#1 Phillips screwdriver	
#2 Phillips screwdriver	
3/8" socket wrench	
Hacksaw	
Tape measure	
1	At auxilliary box, remove power from GTA radio.
2	Using the procedures in table 4.5.8, lower the wind tower to gain access to the antenna.
3	Remove the weather shield from the antenna cable connection and disconnect the antenna cable from the bottom of the antenna. Retain the NF/NF cable adapter.
4	Loosen the terminal lug that holds the ground wire. Remove the ground wire from the antenna.
5	Refer to figure 14.5.4, remove the two 1" pipe straps that secure the antenna pipe to the mounting bracket. Remove the antenna from the bracket.
INSTALLATION	
CAUTION	
The alternative antenna must be field tuned for the operating frequency assigned to the GTA radio. DO NOT cut the antenna elements unless the assigned operating frequency is known.	
1	Refer to figure 14.5.6 and table 14.5.13 to determine the proper lengths to cut the antenna ground plane radials and antenna radiating element. Using a hacksaw, cut the radials and radiating element to the proper lengths for the assigned frequency.
2	Using the removed antenna as a model; assemble the new antenna, attaching the terminal lug under the nut of one of the u-bolts that secure the ground plane radials. Arrange so that the antenna grounding wire can go into the barrel of the terminal lug.
3	Loosely fasten the antenna support pipe to the mounting bracket using the 1" pipe straps. Adjust so that the antenna axis is parallel to the wind tower axis at a distance of 17" to 19" from the tower.
4	Refer to figure 14.5.5. Orient the antenna so the radials are at a 45 degree angle with the wind tower. Tighten the two pipe straps to secure the antenna in this position.
5	Connect the antenna cable to the bottom of the antenna using the NM connector and NF/NF adapter. Cover the connectors using the weather shield provided on the antenna terminal extension.
6	Fasten the antenna grounding wire in the terminal lug barrel.
7	Using the procedures in table 4.5.8, raise the tower.
8	In the auxilliary box, apply power to the GTA radio.
9	Refer to chapter 12. Verify proper operation of GTA radio.

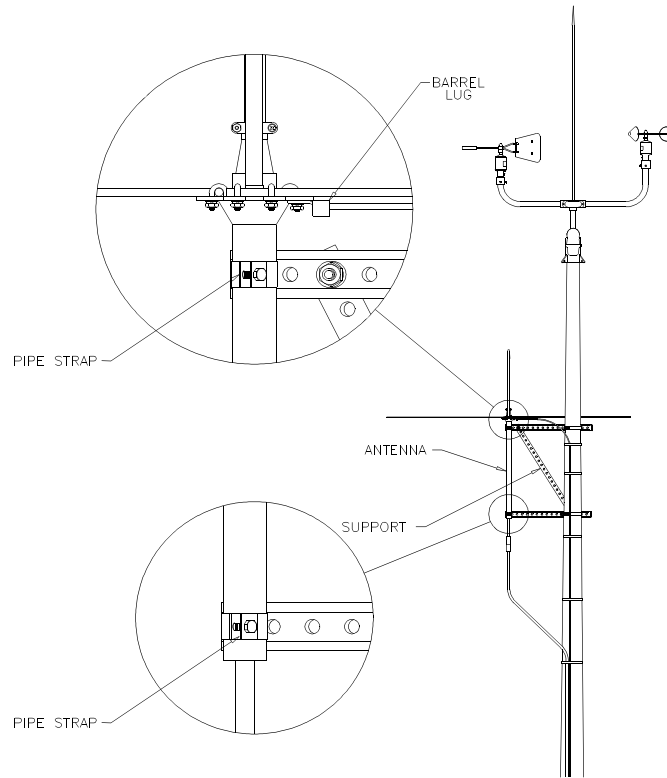


Figure 14.5.4. Alternative Antenna Installation

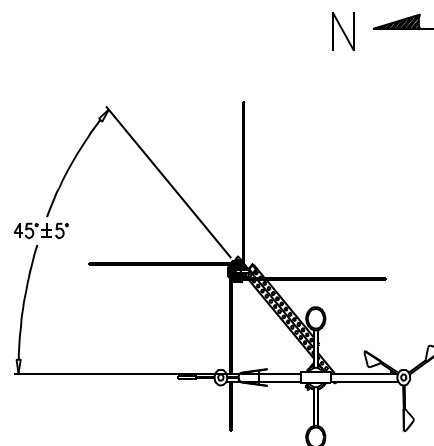


Figure 14.5.5. Orienting Antenna Radials with Wind Tower

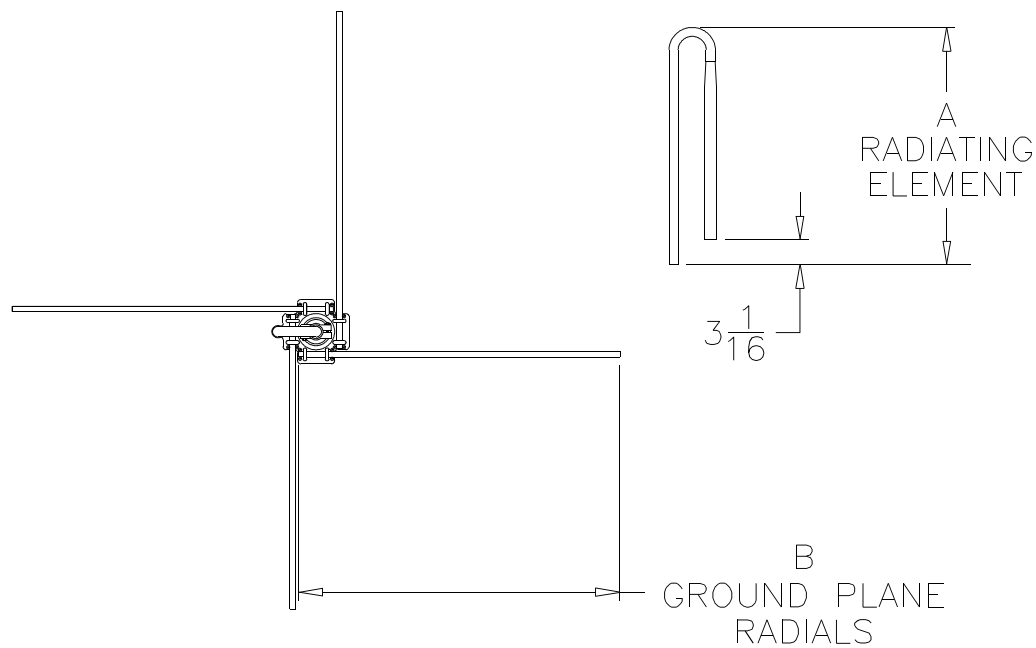


Figure 14.5.6. Ground Plane Radials and Radiating Element

Table 14.5.13. Length of Radiating Element and Ground Plane Radials

GTA FREQ (MHZ)	RADIATING ELEMENT	GROUND PLANE RADIALS	GTA FREQ (MHZ)	RADIATING ELEMENT	GROUND PLANE RADIALS
118	22-3/16"	33-1/2"	128	20-15/32"	30-31/32"
119	22-1/32"	33-7/32"	129	20-5/16"	30-23/32"
120	21-27/32"	32-15/16"	130	20-5/32"	30-1/2"
121	21-11/16"	32-11/16"	131	20-1/32"	30-1/4"
122	21-17/32"	32-7/16"	132	19-7/8"	30-1/16"
123	21-7/32"	32-5/32"	133	19-3/4"	29-7/8"
124	21-1/16"	31-7/8"	134	19-19/32"	29-21/32"
125	20-29/32"	31-11/16"	135	19-7/16"	29-7/16"
126	20-3/4"	31-7/16"	136	19-5/16"	29-1/4"
127	20-19/32"	31-7/32"	137	19-5/32"	29-1/32"